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ABSTRACT

This study examined the effectiveness of imagery to teach native English speakers to associate hiragana characters (a Japanese script) with the spoken Japanese syllables that the characters represent. Twenty-one adults in a psychology of learning class for teachers were taught to picture a hiragana character in such a way as to establish an associative link to the sound of its corresponding syllable. The control condition was direct instruction of character-syllable associations. Results for imagery surpassed results for direct instruction both immediately and after a 2-week delay. The "picture method" is an effective teaching/learning strategy to establish associative links between hiragana characters and the sounds they represent, and might be used to teach other syllabaries. (Author)

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Picture This Character:
Using Imagery to Teach a Japanese Syllabary

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Abstract

This study researched the effectiveness of imagery to teach native English speakers to associate hiragana characters (a Japanese script) with the spoken Japanese syllables that the characters represent. Twenty-one adults in a psychology of learning class for teachers were taught to picture a hiragana character in such a way as to establish an associative link to the sound of its corresponding syllable. The control condition was direct instruction of character-syllable associations. Results for imagery surpassed results for direct instruction both immediately and after a two-week delay. The "picture method" appears to be an effective teaching/learning strategy to establish associative links between hiragana characters and the sounds that they represent, and might be used to teach other syllabaries.

Picture This Character:
Using Imagery to Teach a Japanese Syllabary

Foreign languages present several instructional problems that have been addressed by mnemonic learning strategies. Among them are the translation and definition of individual vocabulary words (Kasper, 1993), the interpretation of ideographs (Wang & Thomas, 1992), and the association of written characters with the spoken syllables that they represent (Quackenbush & Ohso, 1991). Each type of problem tends to be addressed by a different strategy. The purpose of this paper is to report on the effectiveness of a mnemonic strategy developed for teaching native English speakers to associate characters in Japanese writing with the sounds of spoken Japanese.

Hiragana is a commonly used Japanese script based on syllables rather than an alphabet. To facilitate learning to read and write in hiragana, a set of instructional materials utilizing imagery was developed for native English speakers. These materials were widely distributed in the 1980s in Australia (Quackenbush & Ohso, 1991), and today they are are available in the United States. They are claimed to be in use with over 20,000 students each year. They consist of a set of 46 cards, each portraying a hiragana character on one side, and on the other side, the same character elaborated into a meaningful picture that can be associated by an English speaker with a spoken syllable in Japanese.

The research problem posed by these materials involves a

method of instruction which uses imagery to mediate learning. This method of mediation ressembles the more familiar keyword method. The keyword method (Atkinson, 1975) is a well known and frequently researched acoustic/visual mnemonic. It begins with finding an acoustic link betweén a word to be translated and some concrete object. The word carta (Spanish for "letter"), for example, might acoustically suggest a "cart." The meaning of the word is then associated with an image of the concrete object. In this example, a huge letter might be visualized sitting in a grocery cart. Pronouncing the word to be translated cues the acoustic link to the concrete object ("carta"-"cart"), and then the visual link to the word meaning (cart-letter).

The fundamental learning principles involved in the keyword method are contiguity and mediation. Images are superimposed, and their contiguity at the time that they are sensed establishes an associative link between them. Contiguity is at the heart of associative learning, and is necessary to explain why the keyword method should be effective.

As important as contiguity, however, is the mediation of learning created by the meaningful image. A meaningful image (or an image rich in associations) is used to link an unfamiliar word with its meaning. Mediation to increase the meaningfulness of what is to be learned is generally an effective way to improve recall of paired associates (Wakefield, 1996). In particular, the keyword method improves recall of word meanings much better than either context learning or rote learning whenever exposure time

is held constant and when there is no delay in assessment (McDaniel, Pressley, & Dunay, 1987; Pressley, Levin, Hall, Miller, & Berry, 1980). The comparative advantage of the keyword method is lost after about a week, however, if no further elaboration of learning occurs (McDaniel et al., 1987; Wang, Thomas, & Ouellette, 1992).

The keyword method assumes that an acoustic link can be generated between the word to be learned and some concrete object, but in learning hiragana characters, this assumption does not hold because the learner does not know the sound which each character symbolizes. Consequently, in learning to associate characters with sounds, the visual link needs to precede the acoustic link. The visual image needs to cue the spoken syllable rather than the spoken syllable cue the visual image.

The materials to teach hiragana operate in just this manner. A hiragana character is elaborated into imagery that cues the sound of the syllable which the character represents. For example, the hiragana character which resembles a script *h* (which represents the syllable "en") is depicted on the back of one card with a darker script *n* superimposed over it. When presented with the character after mnemonic instruction, the learner recalls the visual image of the superimposed *n* to cue the acoustic link to the syllable ("en"). In other words, the character cues the visual imagery, and the imagery cues the sound of the syllable. As another example, the hiragana character which resembles an "L" (which represents the syllable "she") is depicted as part of a

drawing of a girl's head, with the character representing her straight hair, ending in a curl. When subsequently presented with the character alone, the learner recalls the superimposed image of the girl, and the imagery cues the syllable, "she."

Whereas the keyword method is an acoustic/visual mnemonic, the method for learning hiragana is a visual/acoustic mnemonic. The leaning principles are the same as in the keyword method, but in the method to learn hiragana, the use of visual imagery precedes the auditory link. This subtle, but important difference between the keyword method and the method to learn hiragana derives from the specialized problem of learning to associate characters with sounds. Our hypothesis was that the method to learn hiragana--which we will call the **picture method**--is an effective strategy to teach adult students to associate hiragana characters with spoken Japanese syllables. This hypothesis was tested in the following study.

Method

Participants

The study involved 21 adults enrolled in a graduate level psychology of learning class. None was acquainted with written or spoken Japanese. All participated voluntarily.

Materials

The instructional materials were 10 cards selected from a pool of 46 cards (Quackenbush & Ohso, 1991) for the directness of the link between the imagery on the card and the sound of a corresponding Japanese syllable. Each card was 8 1/2 inches by 11

inches and depicted a hiragana character on the front. On the back of each card, the same character had been elaborated into a meaningful image.

The assessment materials consisted of a matching exercise (see Appendix). Two columns consisted of 10 hiragana characters (with blanks beside them) and 10 phonetic representations of corresponding Japanese syllables (with letters a through j beside them). Odd-numbered characters had been taught using imagery, and even-numbered chracters had been taught using direct instruction. Phonetic representations of syllables (in the second column) were listed randomly. The assessment task was to match the hiragana characters with the corresponding syllables by writing the letter beside the appropriate syllable on the blank beside each character.

Design and Procedure

The same participants spent equivalent time learning to associate different sets of hiragana characters with Japanese syllables by using either imagery or by direct instruction, and their learning was assessed both immediately and after two weeks' delay.

For the first five cards randomly selected from the pool of ten, the experimenter used imagery. She presented a hiragana character to participants, pronounced it, then flipped the card over to the picture side, briefly explaining the acoustic link between the picture and the Japanese syllable. Finally, participants pronounced the syllable. This procedure was repeated

twice for each of the five cards. Total exposure time for each card was 30 seconds.

For the remaining five cards, the experimenter used direct instruction. She presented a hiragana character, modeled the pronounciation of the relevant syllable, then had the participants pronounce it while observing the character. This procedure served as the control condition. It was repeated twice for each of the second five cards. Again, total exposure time for each card was 30 seconds.

Testing consisted of administering the matching exercise immediately after direct instruction and then again two weeks later. Scores were the total number of correct character-syllable matches that had been taught through imagery, and the total number of correct character-syllable matches that had been taught by direct instruction, either immediately or after two weeks. Statistical analysis of results was conducted through one-tailed *t*-tests for dependent samples.

Results

Means of scores for both immediate and delayed recall of characters taught by either imagery method or by direct instruction are displayed in Table 1. The most important finding was that immediately after instruction, the number of correct matches for characters taught through imagery surpassed the number of correct matches for characters taught through direct instruction ($t = 9.76$, $p < .0001$).

Long-term retention was assessed by comparing immediate

recall scores with recall scores after a two-week delay. The average number of correct matches for characters taught by imagery decreased significantly ($t = -5.78$, $p < .0001$), as did the average number of correct matches for characters taught by direct instruction ($t = -4.42$, $p < .0001$). Nevertheless, the matches made for characters taught through imagery continued to surpass the matches for characters taught through direct instruction ($t = 4.15$, $p < .0002$).

Discussion

Several conclusions emerge from this study, the most important of which is support for the effectiveness of imagery for learning to associate hiragana characters with the spoken syllables that they represent. On the test of immediate recall, imagery was clearly superior to direct instruction. This finding does not constitute an evaluation of the entire set of instructional materials, but it does verify the central hypothesis of the study, that imagery is an effective way to teach students to associate hiragana characters with their corresponding sounds.

The forgetting which occurred after the initial assessment was significant for both imagery and direct instruction, however, suggesting that learning even by imagery was relatively short term. It should be recalled that none of the participants were familiar with the Japanese language, so recall was based upon the associations learned at the time of instruction, and not upon further elaboration or practice of the associations during the

interval between tests.

Given the absence of elaboration or practice, we were somewhat surprised to find that after two weeks, recall of characters learned through imagery still surpassed recall of characters learned through direct instruction. We need to interpret this finding cautiously, however, because participants received essentially an extra exposure to characters learned through imagery due to the high rate of recall during the initial assessment (over 80 percent correct matches). If this effect had been controlled through a between-subject experimental design, the rate of forgetting mnemonically-assisted learning would probably have been higher than the rate of forgetting rote learning, resulting in little difference between mnemonically-assisted and unassisted recall after only a week delay (e.g., Wang et al., 1992).

Other threats to validity included the nonrandom order of presentation of stimulus materials and a floor effect on the measure of recall. These threats were perceived as relatively minor because participants received equivalent time in learning under the two conditions, and because the floor effect seemed to favorably bias the results of direct instruction (the control condition) rather than the results of the experimental condition.

The finding that imagery surpassed direct instruction places the "picture method" among other mnemonic strategies which utilize imagery and which are effective tools to facilitate short-term learning. The picture method might be useful for

second language learners who are learning to read and write Japanese, either in hiragana or katakana (a syllabary used for foreign words). The picture method also might be effective in learning to read and write kanji (Chinese characters) and hankul (the Korean syllabary).

Further studies need to be conducted in the domains of research and evaluation. A larger research study needs to be conducted with a between-subjects design and a larger set of instructional materials to minimize threats to validity. This or another study might also incorporate a factorial design to determine whether images judged to have closer associations with hiragana characters and Japanese syllables are more effective than images judged to have more remote associations with characters and syllables. The results of these studies can be used to improve the materials for use with speakers of American English. It should be recalled that the instructional materials used in this study were developed in Australia, where many English words are pronounced somewhat differently than in the United States.

Another study might be conducted to compare the effectiveness of images supplied to the learner with images generated by the learner. This issue has emerged in research on the keyword method (e.g., Hall, 1988), and is related to the larger issue of learner control of learning strategies. Materials generated by the learner would require them to create their own images to cue syllable sounds. Currently, we do not know whether

such images would be more, less, or just as effective as images supplied by the teacher.

Due to design limitations, we could not conclude that imagery resulted in a long-term retention rate that surpassed the control condition (direct instruction). Furthermore, the advantage of any mnemonic strategy over contextual instruction is likely to be lost if what is learned is not applied within a week or so. Nevertheless, we can conclude from this small study that the picture method is an effective strategy for attaining the short-term goal for which it was designed, particularly when contrasted with direct instruction. The picture method is an effective mediation strategy to facilitate the association of hiragana characters with the syllables that they represent.

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Table 1

Mean Performance on Matching Exercises by Condition

Condition	Measure	
	Immediate recall	Delayed recall
Imagery	4.29	1.24
Direct instruction	1.43	0.14

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Japanese Hiragana Characters

Match each Japanese Hiragana Character with its phonetic spelling:

1.		_____	a.	sĕ
2.		_____	b.	hē
3.		_____	c.	hĕ
4.		_____	d.	mō
5.		_____	e.	tō
6.		_____	f.	tsu
7.		_____	g.	shē
8.		_____	h.	ē
9.		_____	i.	mē
10.		_____	j.	oo